

Title (en)  
COMPOSITIONS COMPRISING ANGIOGENIC FACTORS AND USES THEREOF

Title (de)  
ZUSAMMENSETZUNG MIT ANGIOGENEN FACTOR

Title (fr)  
COMPOSITION COMPRENANT UN FACTEUR ANGIOGENIQUE

Publication  
**EP 3269799 A1 20180117 (EN)**

Application  
**EP 17159666 A 20100304**

Priority  
• US 15736709 P 20090304  
• EP 10749350 A 20100304

Abstract (en)  
A recombinant *Listeria* strain expressing an angiogenic factor, wherein the angiogenic factor is endoglin or an immunogenic fragment thereof. The angiogenic factor or immunogenic fragment thereof may be to a non-hemolytic LLO polypeptide which enhances the immunogenicity of the angiogenic factor or the immunogenic fragment.

IPC 8 full level  
**C12N 1/21** (2006.01); **A61K 39/00** (2006.01); **A61K 39/02** (2006.01); **A61K 45/06** (2006.01); **C07K 14/195** (2006.01); **C12N 15/74** (2006.01); **C07K 14/47** (2006.01); **C07K 14/71** (2006.01)

CPC (source: EP US)  
**A61K 39/0011** (2013.01 - EP US); **A61K 39/001109** (2018.08 - EP US); **A61K 39/001162** (2018.08 - EP US); **A61K 45/06** (2013.01 - US); **A61P 35/00** (2018.01 - EP); **A61P 35/04** (2018.01 - EP); **A61P 37/04** (2018.01 - EP); **A61P 43/00** (2018.01 - EP); **C07K 14/195** (2013.01 - US); **C07K 14/4748** (2013.01 - EP US); **C07K 14/71** (2013.01 - EP US); **C12N 15/74** (2013.01 - US); **A61K 2039/522** (2013.01 - EP US); **A61K 2039/523** (2013.01 - EP US); **A61K 2039/53** (2013.01 - EP US); **A61K 2039/57** (2013.01 - US); **A61K 2039/585** (2013.01 - US); **A61K 2039/6037** (2013.01 - EP US); **A61K 2039/6068** (2013.01 - EP US); **C07K 2319/55** (2013.01 - US)

Citation (applicant)  
• US 6855320 B2 20050215 - PATERSON YVONNE [US]  
• US 54161404 A 20040108  
• US 88971507 A 20070815  
• US 24482808 A 20081003  
• US 4683195 A 19870728 - MULLIS KARY B [US], et al  
• WO 9209300 A1 19920611 - ITEREX PHARMA LP [US]  
• EP 1408048 A1 20040414 - INST NAT SANTE RECH MED [FR]  
• US 2007154953 A1 20070705 - BRUNNER HERWIG [DE], et al  
• US 6773900 B2 20040810 - SHORT JAY M [US], et al  
• WO 2010102140 A1 20100910 - UNIV PENNSYLVANIA [US], et al  
• DOMINIECKI E, CANCER IMMUNOL IMMUNOTHER., vol. 54, no. 5, 6 October 2004 (2004-10-06), pages 477 - 88  
• BEATTY; PATERSON, J IMMUNOL., vol. 166, no. 4, 15 February 2001 (2001-02-15), pages 2276 - 82  
• FRANKEL, FR; HEGDE, S; LIEBERMAN, J; Y PATERSON: "Induction of a cell-mediated immune response to HIV gag using *Listeria monocytogenes* as a live vaccine vector", J. IMMUNOL., vol. 155, 1995, pages 4766 - 4774  
• MATA, M; YAO, Z; ZUBAIR, A; SYRES, K; Y PATERSON: "Evaluation of a recombinant *Listeria monocytogenes* expressing an HIV protein that protects mice against viral challenge", VACCINE, vol. 19, 2001, pages 1435 - 45  
• BOYER, JD; ROBINSON, TM; MACIAG, PC; PENG, X; JOHNSON, RS; PAVLAKIS, G; LEWIS, MG; SHEN, A; SILICIANO, R; BROWN, CR: "DNA prime *Listeria* boost induces a cellular immune response to SIV antigens in the Rhesus Macaque model that is capable of limited suppression of SIV239 viral replication", VIROLOGY, vol. 333, 2005, pages 88 - 101  
• SUN ET AL., INFECTION AND IMMUNITY, vol. 58, 1990, pages 3770 - 3778  
• LAUER P; CHOW MY ET AL.: "Construction, characterization, and use of two LM site-specific phage integration vectors", J BACTERIOL, vol. 184, no. 15, 2002, pages 4177 - 86  
• SAMBROOK ET AL.: "Molecular Cloning: A Laboratory Manual", 1989, COLD SPRING HARBOR LABORATORY  
• AUSUBEL ET AL.: "Current Protocols in Molecular Biology", 1997, JOHN WILEY & SONS  
• CAUDY AA ET AL., GENES & DEVEL, vol. 16, pages 2491 - 96  
• NEILSEN PE, CURR OPIN STRUCT BIOL., vol. 9, pages 353 - 57  
• RAZ NK ET AL., BIOCHEM BIOPHYS RES COMMUN., vol. 297, pages 1075 - 84  
• PURCHIO; G. C. FAREED, METHODS IN ENZYMOLOGY: METHODS FOR MOLECULAR CLONING IN EUKARYOTIC CELLS, 2003  
• SAMBROOK ET AL.: "Molecular Cloning: A Laboratory Manual", 2001, COLD SPRING HARBOR LABORATORY  
• BRENT ET AL.: "Current Protocols in Molecular Biology", 2003, JOHN WILEY & SONS  
• WILLIAM E. PAUL: "Fundamental Immunology, 5th ed.", August 2003, LIPPINCOTT WILLIAMS & WILKINS, article GJV NOSSAL: "Chapter 43: Vaccines"  
• ROGERS S ET AL.: "Amino acid sequences common to rapidly degraded proteins: the PEST hypothesis", SCIENCE, vol. 234, no. 4774, 1986, pages 364 - 8  
• RECHSTEINER M ET AL.: "PEST sequences and regulation by proteolysis", TRENDS BIOCHEM SCI, vol. 21, no. 7, 1996, pages 267 - 71  
• RECHSTEINER; ROGERS, TRENDS BIOCHEM. SCI., vol. 21, 1996, pages 267 - 271  
• ROGERS S ET AL., SCIENCE, vol. 234, no. 4774, 1986, pages 364 - 8  
• KYTE, J; DOOTLITTLE, RF., J. MOL. BIOL., vol. 157, 1982, pages 105  
• GARAY-MALPARTIDA HM; OCCHIUCCHI JM; ALVES J; BELIZARIO JE, BIOINFORMATICS, vol. 21, no. 1, June 2005 (2005-06-01), pages 1169 - 76  
• C.A. RAMSDEN: "Quantitative Drug Design", 1992, F. CHOPLIN PERGAMON PRESS, article "Chapter 17.2"  
• AUSUBEL ET AL.: "Current Protocols In Molecular Biology", 1991, article "Chapter 15"  
• AUSUBEL ET AL.: "Current Protocols In Molecular Biology", article "Chapter 8"  
• SAMBROOK ET AL.: "Molecular Cloning: A Laboratory Manual, 2nd ed", 1989  
• ZOLLER ET AL., METHODS ENZYMOL., vol. 100, 1983, pages 468 - 500  
• ZOLLER; SMITH, DNA, vol. 3, 1984, pages 479 - 488  
• ZOLLER ET AL., NUCL. ACIDS RES., vol. 10, 1987, pages 6487  
• BRAKE ET AL., PROC. NATL. ACAD. SCI. USA, vol. 81, 1984, pages 4642 - 4646

- BOTSTEIN ET AL., SCIENCE, vol. 229, 1985, pages 1193
- KUNKEL ET AL., METHODS ENZYMOL., vol. 154, 1987, pages 367 - 82
- ADELMAN ET AL., DNA, vol. 2, 1983, pages 183
- CARTER ET AL., NUCL. ACIDS RES., vol. 13, 1986, pages 4331
- WELLS ET AL., GENE, vol. 34, 1985, pages 315
- WELLS ET AL., PHILOS. TRANS. R. SOC. LONDON SERA, vol. 317, 1986, pages 415
- OGASAWARA ET AL., PROC. NATL. ACAD. SCI. USA, vol. 89, October 1992 (1992-10-01), pages 8995 - 8999
- FIELD ET AL., MOL. CELL. BIOL., vol. 8, 1988, pages 2159 - 2165
- EVAN ET AL., MOLECULAR AND CELLULAR BIOLOGY, vol. 5, 1985, pages 3610 - 3616
- PABORSKY ET AL., PROTEIN ENGINEERING, vol. 3, no. 6, 1990, pages 547 - 553
- HOPP ET AL., BIOTECHNOLOGY, vol. 6, 1988, pages 1204 - 1210
- MARTIN ET AL., SCIENCE, vol. 255, 1992, pages 192 - 194
- SKINNER ET AL., J. BIOL. CHEM., vol. 266, 1991, pages 15163 - 15166
- LUTZ-FREYERMUTH ET AL., PROC. NATL. ACAD. SCI. USA, vol. 87, pages 6393 - 6397
- LAROCHELLE ET AL., J. CELL BIOL., vol. 139, no. 2, 1995, pages 357 - 66
- HEIDARAN ET AL., FASEB J., vol. 9, no. 1, 1995, pages 140 - 5
- ASHKENAZI ET AL., INT. REV. IMMUNOL., vol. 10, no. 2-3, 1993, pages 219 - 27
- CHEON ET AL., PNAS USA, vol. 91, no. 3, 1994, pages 989 - 93
- HAMES, B. D., AND HIGGINS S. J.: "Nucleic Acid Hybridization", 1985
- SAMBROOK ET AL.: "Molecular Cloning, A Laboratory Manual", 2001, COLD SPRING HARBOR PRESS
- AUSUBEL ET AL.: "Current Protocols in Molecular Biology", 1989, GREEN PUBLISHING ASSOCIATES AND WILEY INTERSCIENCE
- MIZUKAM ET AL., NATURE MED., vol. 11, 2005, pages 992 - 97
- HATFIELD ET AL., CURR. CANCER DRUG TARGETS, vol. 5, 2005, pages 229 - 48
- VALLBOHMER ET AL., J. CLIN. ONCOL., vol. 23, 2005, pages 3536 - 44
- REN ET AL., ANN. SURG., vol. 242, 2005, pages 55 - 63
- MACIAG ET AL., CANCER RES., vol. 68, no. 19, 1 October 2008 (2008-10-01), pages 8066 - 75
- SEWELL ET AL., CANCER RESEARCH, vol. 64, 2004, pages 8821 - 8825
- EDELSON ET AL., IMMUNITY, vol. 14, 2001, pages 503 - 512

#### Citation (search report)

- [A] WO 03073995 A2 20030912 - SCRIPPS RESEARCH INST [US]
- [Y] US 2007207171 A1 20070906 - DUBENSKY THOMAS W [US], et al
- [E] WO 2010040135 A1 20100408 - UNIV PENNSYLVANIA [US], et al
- [A] WO 2008079172 A2 20080703 - UNIV PENNSYLVANIA [US], et al
- [E] WO 2010027827 A2 20100311 - AMPLIMMUNE INC [US], et al
- [A] MATTHEW M SEAVEY ET AL: "A Novel Human Her-2/neu Chimeric Molecule Expressed by Listeria monocytogenes Can Elicit Potent HLA-A2 Restricted CD8-positive T cell Responses and Impact the Growth and Spread of Her-2/neu-positive Breast Tumors", CLINICAL CANCER RESEARCH, THE AMERICAN ASSOCIATION FOR CANCER RESEARCH, US, vol. 15, no. 3, 1 February 2009 (2009-02-01), pages 924 - 932, XP008157318, ISSN: 1078-0432, DOI: 10.1158/1078-0432.CCR-08-2283
- [Y] SHEN H ET AL: "Recombinant Listeria monocytogenes as a live vaccine vehicle for the induction of protective anti-viral cell-mediated immunity", PROCEEDINGS NATIONAL ACADEMY OF SCIENCES PNAS, NATIONAL ACADEMY OF SCIENCES, US, vol. 92, no. 9, 1 April 1995 (1995-04-01), pages 3987 - 3991, XP002338965, ISSN: 0027-8424, DOI: 10.1073/PNAS.92.9.3987
- [Y] SUNG-HYUNG LEE ET AL: "Endoglin (CD105) is a target for an oral DNA vaccine against breast cancer", CANCER IMMUNOLOGY, IMMUNOTHERAPY, SPRINGER, BERLIN, DE, vol. 55, no. 12, 25 March 2006 (2006-03-25), pages 1565 - 1574, XP019422512, ISSN: 1432-0851, DOI: 10.1007/S00262-006-0155-5
- [A] DÜWEL ET AL: "Reduced tumor growth and angiogenesis in endoglin-haploinsufficient mice.", 14 November 2006 (2006-11-14), XP055428481, Retrieved from the Internet <URL:http://www.ncbi.nlm.nih.gov/pubmed/17108712> [retrieved on 20171124]
- [YP] M. M. SEAVEY ET AL: "An Anti-Vascular Endothelial Growth Factor Receptor 2/Fetal Liver Kinase-1 Listeria monocytogenes Anti-Angiogenesis Cancer Vaccine for the Treatment of Primary and Metastatic Her-2/neu+ Breast Tumors in a Mouse Model", THE JOURNAL OF IMMUNOLOGY, vol. 182, no. 9, 1 May 2009 (2009-05-01), US, pages 5537 - 5546, XP055428397, ISSN: 0022-1767, DOI: 10.4049/jimmunol.0803742
- [YP] SHIMA UNEDA ET AL: "Anti-endoglin monoclonal antibodies are effective for suppressing metastasis and the primary tumors by targeting tumor vasculature", INTERNATIONAL JOURNAL OF CANCER, vol. 125, no. 6, 15 September 2009 (2009-09-15), pages 1446 - 1453, XP055208380, ISSN: 0020-7136, DOI: 10.1002/ijc.24482
- [Y] JIAO ET AL: "A plasmid DNA vaccine encoding the extracellular domain of porcine endoglin induces anti-tumour immune response against self-endoglin-related angiogenesis in two liver cancer models", DIGESTIVE AND LIVER DIS, W.B. SAUNDERS, GB, vol. 38, no. 8, 1 August 2006 (2006-08-01), pages 578 - 587, XP005541415, ISSN: 1590-8658, DOI: 10.1016/J.DLD.2006.04.014

#### Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

#### DOCDB simple family (publication)

**WO 2010102140 A1 20100910**; DK 2403935 T3 20170911; EP 2403935 A1 20120111; EP 2403935 A4 20131204; EP 2403935 B1 20170510; EP 3269799 A1 20180117; ES 2637068 T3 20171010; JP 2012519490 A 20120830; JP 2014158496 A 20140904; JP 2016222715 A 20161228; JP 5539411 B2 20140702; PT 2403935 T 20170922; US 10695410 B2 20200630; US 2012114685 A1 20120510; US 2015079034 A1 20150319; US 2016206716 A1 20160721; US 2017049867 A1 20170223; US 2019117750 A1 20190425; US 8778329 B2 20140715; US 9408898 B2 20160809; US 9919038 B2 20180320; US 9981024 B2 20180529

#### DOCDB simple family (application)

**US 2010026257 W 20100304**; DK 10749350 T 20100304; EP 10749350 A 20100304; EP 17159666 A 20100304; ES 10749350 T 20100304; JP 2011553117 A 20100304; JP 2014094232 A 20140430; JP 2016182735 A 20160920; PT 10749350 T 20100304; US 201013254607 A 20100304; US 201414304689 A 20140613; US 201614996746 A 20160115; US 201615225205 A 20160801; US 201815990790 A 20180528